Conveyor system

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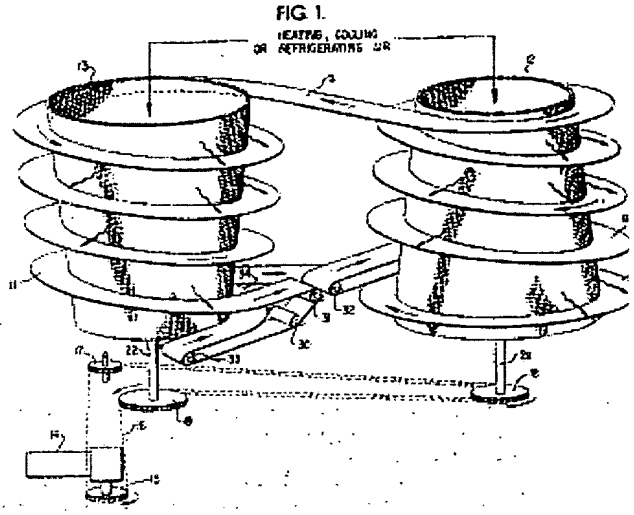
Abstract of **GB1090630**

1,090,630. Endless conveyers. ASHWORTH BROS. Inc. Feb. 2, 1966 [Feb. 15, 1965; Oct. 22, 1965], No. 4591/66. Heading B8A. A conveyer system comprises an endless belt 11 driven along a helical path in edgewise curvature around each of a pair of upright drums 12, 13 by sliding frictional engagement between the radial inner edge of the belt 11 and the periphery of said drums 12, 13. The belt 11 is supported along its helical path by a nylon coated trackway (27) and passes up one drum 12 and down the other drum 13, which drums are tapered in the vertical direction of travel of the belt thereon. The tapering of the drums results in a slower drum surface speed for each succeeding loop and a consequential reduction in belt tension, this speed reduction is maintained between the smaller upper end of the drum 12 and the larger upper end of the drum 13 by driving the drum 13 at a slower speed by suitable selection of the relative sizes of driving sprockets 18, 19. To enable the belt to travel between the lower ends of the drums the belt 11 is driven by a supplementary drive gear 27, at a speed less than the surface speed of the driving drums, to provide sufficient tension in the belt around the proceeding drum 13 for drive therebetween and also to provide a catenary loop 38 prior to the succeeding drum 12 so that the belt tension at the initial starting point of drum 12 is substantially zero. The supplementary gear 27 also acts as a belt reverser so that opposite sides of the belt are used for successive circuits of the belt. To permit continuous travel of the articles on the belt, the lower run of the belt passes through a transfer point comprised of a pair of adjacent rollers 31, 32 before passing around rollers 30, 33 and the lower periphery of the drum 13 to the supplementary gear 27. On leaving the gear 27 the belt passes around the lower periphery of the drum 12 and a roller 41 before passing back to the transfer point. Articles on the belt pass



directly across the transfer point from roller 31 to roller 32. The drums are covered with a heavy wire mesh to permit cooled or heated air, blown down the centre of the drum by a fan 24, to pass through the peripheral surface thereof and over the surfaces of the conveyer belt. In an alternative embodiment, Fig. 4 (not shown), each drum is replaced by a series of vertical spaced discs (104), each of the belt loops passing between and around both sets of discs. The taper effect of the drums is achieved by discs of decreasing diameter in the vertical direction of travel of the belt or alternatively by discs of a constant diameter driven at decreasing speeds in the said direction by a series of concentric drive-shafts. Both sets of discs decrease in diameter or speed of rotation in the same direction. Each disc may be provided with peripheral flanges so that the elevation of the belt in passing around the discs is constant and the rise of the belt is achieved in the straight portions therebetween. In a further embodiment, Figs. 5-8 (not shown), each drum (112), (113) comprises an upper and lower ring (146), (147) joined by a plurality of spaced rods (148). Each drum (112), (113) is driven by a motor (114), (121), through a gear (116), (123) engaging a ring gear (117), (124) around the inner periphery of the upper rings (146). The ring gears (117), (124) are interconnected by a gear train (125) to ensure the same speed of rotation of the drums and also drive supplementary drives (127), (132), (135) through respective gear trains (126), (131), (134), which gear trains (126), (131) incorporate clutches (128), (133) to permit reversal of the direction of travel of a belt (111). The belt (111) comprises a plurality of transverse rods (151) which interconnect a plurality of U-shaped members (152) slidable within one another and slotted to receive the rods 151, thus permitting edgewise rotation. The ends (153) of the rods (151) protrude beyond the U-shaped members and are spaced to engage successive rods (148) of the drums whereby the rods do not touch the U-shaped members. The belt on leaving the lower end of the drum (112) passes through a discharge station (154) to the supplementary gear (127) and then around a reversal roller (158) before passing around the lower periphery of the drum (112) to the supplementary gear 132 and thence to the drum (113). In a further embodiment, Fig. 9, 10 (not shown), the rods (248) are inclined in a direction towards the decline of the belt loops such that the protrusion (153) of the belt rods (151) slide along the rods as a result of the speed differential between the belt and the drum. The angle of inclination of the rods (248) is preferably twice the angle of inclination of the belt, e.g. the rods are inclined at 10 degrees to the vertical when the belt is inclined at 5 degrees to the horizontal. The co-efficient of friction between the belt and the drum and between the trackway and the belt are correlated in each embodiment such that the belt tension is less than that which would cause one

edge of the belt to be raised above the other.
